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THE THIRTEENTH CONVENTION OF THE PHOTOGRAPHERS' ASSOCIATION OF AMERICA.

HELD AT CHICAGO, ILL., JULY 18–21, 1893.

THE Convention was opened on Tuesday, July 18th, in the Second Regiment Armory on Washington Boulevard. After the Convention was called to order by President Place, and the reading of the last minutes was dispensed with, the Rev. Dr. Thomas was introduced and made an address of welcome, in place of Mayor Carter H. Harrison, after which the President delivered his address to the convention as follows:

LADIES AND GENTLEMEN OF THE PHOTOGRAPHERS' ASSOCIATION OF AMERICA:

I certainly feel honored in presiding over this, our thirteenth convention of Photographers of America, and especially when held in the World's Fair City, the four hundredth anniversary of this great country of ours. We should congratulate ourselves that we are able to be here at this time, not only to mingle with those of our profession, but that we have the privilege of visiting the great white city on the lake, which, I assure you, will be a great pleasure.

On account of this attraction, which no doubt many of you will go to see, I have decided to make our sessions short and to the point, consequently, I shall be brief, and take but little of your time.

At the meeting of the Executive Committee in June, 1892, we had in the treasury seven hundred dollars, which was considerably de-

pleted by this time. However, we hope to show a nice balance to our successors in office. We should certainly congratulate ourselves that we have this fine hall to show our goods and hold our meetings in, and had we not secured it when we did, we would have to convene in the lake front, out in the open air, or under a tent. This building could be rented for four times as much this week as we are paying for it.

We have secured very fine prizes. I believe in investing a large amount of our income in prizes. It will create an interest for photographers to compete, to see the walls of our convention halls filled with the productions of photographers from all over this country and others. It sends one home with new life and vigor, to start anew and improve his or her observation.

As to the question of prices: I shall leave that with you. It has been discussed until it is threadbare, and so are the clothes of some of those that have seen fit to work for nothing and board themselves. I will suggest, however, that if we get those men who make work cheap into our local, state or national associations, it will help them to do better work and help them to get better prices.

A school of photography is what we want, where we can go and learn the different branches of the business, and what they learn, learn from one who is competent to teach them. I would suggest a school of photography be established in some large city, where practical demonstrations could be taught, the same as a medical school or any other professional institution.

Now, I don't want you to think that I think that this is original with me, for it is not. This question is as hard to solve as prices, and has been talked of and tried for years, but, I am sorry to say, with but little success. Let this institution be managed and controlled by the P. A. of A. and I believe it would be, in a short time, self-sustaining.

I have found, during my administration, grievances among a great many members of this association, which I am sorry to see. Let us, from now on, let by-gones be by-gones, and start and see if we can't improve and make this one of the grandest associations of this country.

In conclusion let me thank the officers and members of this association for their cordial support, and I shall try and fill the position as President of this association to the best of my ability, without preju dice or partiality, and I hope that when we separate from this, our thirteenth convention, I may have the friendship and esteem of every member of the Photographers' Association of America.

The treasurer's report was then presented and accepted. During the second day one of the most interesting features was reading reports received from State organizations.

Wm. Griffin, delegate from Nebraska, begged to submit the following report concerning the Nebraska Photographers' Association:

Our association was formed in September, 1888, with a membership of about twenty-five. To-day we have a membership of nearly one hundred, and interest in the organization which is daily increasing.

We have succeeded in convincing our brother photographers through the states that it is necessary for us to band together, to protect our interest, and the main object of the association financially has been gained, viz., the protection of uniform and regular prices. Not only has the organization benefited us financially, but also in the advancement of our art. At each of our annual meetings there has been a noted improvement in the work exhibited by the members, resulting from the interchanging of ideas and intelligent discussions of the trade.

We bear witness to the benefits of a state of organization, and recommend to our brothers in the states where no organizations have been formed that they organize at once and share with us the benefits derived therefrom.

The Photographers' Association of Iowa would respectfully report to this convention that, after four years' experience as a State Association, we can confidently and cheerfully recommend the organization of State associations as being the greatest and best school for improving our productions and the safest and quickest way for the increase in the price of work. Since our organization, five years ago, we feel safe in saying that the general price of photographs has increased twenty per cent. and the tendency is still for better prices, and as a result of mingling together once a year, the quality of work has progressed equally with the prices. We feel proud as a state that Iowa took the initiatory step in State organization and congratulate other states that have fallen into line. We now have a membership of about one hundred and twenty-five. Our next convention will be held at Des Moines, Iowa, early in February, 1894, and we cordially invite our brother photographers from other states to visit us. (Signed) T. L. Wales, *President;* J. Verran, *Secretary.*

St. Louis was selected as the next place of meeting in 1895. The session was closed with the nomination of the officers to serve during the following year.

On Thursday the election for officers took place and resulted in the unanimous choice of the regular nominees, viz.:

For president, Adam Heimberger, New Albany, Ind. Vice-president, George T. Bassett, New York. 2d Vice-president, D. Rad Coover, Chicago. Secretary, David P. Thompson, Kansas City, Mo. Treasurer, John S. Schneider, Columbus, Ohio.

On Friday the judges of awards made their report and announced their decisions in the various prize competions as follows

Grand Prize—Heimberger & Son, first; Baker & Co., second.
Class A—Julius Strauss, first; Montford & Hill, second.
Class D—Heimberger & Son, first; Fowler, second.
Class E—McCrary & Benson, first; Fowler, second.
Class H—Beck, first; W. H. Irskin, second.
Class I—Chas. Hetherington.
Class J—Pifer & Becker, diploma; L. C. Overpeck, diploma.
Class K—K. Gregor, first; Reutlinger, second; S. W. Bhedwar, third.
Class C—Steckel, first; Stein, second; Gilbert & Bacon, third.
Diploma for most tastefully arranged exhibit—J. de Vos, Warsaw, Indiana.
Class B—Steckel, first; Dana, second; Coover, third.
Class F—James Inglis, first; E. Long & Son, second.
Foreign Prizes—England, McGregor, first; France, Reutlinger, second; India, Bhedwar, third.
Awards for the Murdock Aristotype Paper—Class A, first premium, $500, Stein; Class B, second premium, $200, Eltem; Class D, fourth premium, $100, Schumacher; Class E, fifth premium, $50, Sargent; Sweepstakes Diamond Medal, Scott.
Prizes in the $1,200 Kloro Contest, given by the Photo-Materials Co., of Rochester, N. Y.—Class A, $500, Rosch, of St. Louis, first; $150, S. L. Stein, of Milwaukee, second; $100, Scott, of Chicago, third. Class B, $150, Cornell, of Rochester, first; $75, Root, of Chicago, second; $50, Ulhman, of St. Joseph, Mo., third. Class C, $100, Strinjsson, Appleton, Wis., first; $50, H. Levin, Chicago, second; third thrown out, not merit enough.

The Convention then adjourned until next year, in St. Louis, at the time to be announced by the executive committee.

The subject around which centred the greatest interest, after the reading of the reports of the State organizations, was the demonstration of the Williams' System of Flash-light Photography. The "boom" and the vivid flash were of frequent occurrence during the whole time of the convention, and the apparatus proved a matter of great interest to all progressive photographers who attended the sessions. In the demonstrations *Blitz-pulver* was used exclusively, and the fine results produced fully substantiated the superiority of that compound over all other artificial illuminants for flash-light photography.

Photo-telegraphy.—Prof. W. W. Tacques recently described some experiments he witnessed in sending photographs over a wire by means of electricity. The laboratory consisted of two rooms; in one was an ordinary photographic camera, a small developing closet, and on a table in the middle of the room a cubical box, in one side of which was a slide of sufficient size to receive a postal card. From this box two wires stretched across the room to the partition wall, and passing through this, extended to a similar cubical box standing on a table in the middle of the adjoining room. I was given an ordinary postal card and asked to write a short note upon it, and wrote, "Good morning! How do you do?" My friend then took the card and placed it about six inches in front of the camera, where it was well illuminated by an electric lamp. Then he pressed the button of the camera, then took the plate-holder to the developing closet, and presently reappeared with a hastily-made negative, which he dropped into the slit in the cubical box on the table in the middle of the room. I then went into the adjoining room, and there issuing from the corresponding box on the table in the middle of the room, was a piece of thin card the size of a postal card, on which appeared in facsimile the words I had written, "Good morning! How do you do?" There would seem to be no reason why the sending and receiving boxes, instead of being in adjoining rooms, should not be placed one at one end of the wires in one town and the other at the other end in another place miles away, and thus letters written to one city could be instantaneously photographed to the other, and beat the mail by six or seven hours.—*Brooklyn Standard Union.*

WHAT WASTES TO SAVE AND HOW TO SAVE THEM.

CHARLES COOPER, NEWARK, N. J.

WHAT would the family photographer say to his wife if he knew that one-half of every barrel of flour he provided for his household was allowed to fall under foot, or to be burned in the stove as fuel. And yet we dare to say that one-half of the photographers allow at least one-half of the precious metals they purchase for picture-making to be wasted as wickedly as though its cost was no greater than that of common flour. One pound of silvered albumenized paper in good health, *i. e.*, when it is clean and free from nails and bits of tintype plates, cardboard, glass or other dirt and solids, is worth from forty to fifty cents, according to the strength of the silver solution, the amount of salting in the paper, and the treatment of it. This value is somewhat reduced by the exposure of the sensitized paper to the light, for a part of the silver is thus rendered insoluble, and so recovery of all the silver is beyond the power of chemistry. Yet, after all, nearly sixty per cent. of the silver you purchase can be retured to you, and a goodly part of the gold, if you will carefully follow the directions given below.

A. *Developer Drippings.*—Enough protosulphate of iron remains in the drippings from the development of wet plates to precipitate the silver. What is needed, then, is to carefully catch what goes off the plate in a proper vessel, and allow it to settle. Pour off the clear water *once a day*. This last is important, for when the water is allowed to remain for some days the recovery of the silver becomes more difficult, and therefore the amount recovered is much lessened, owing to the large quantity of iron present. If left any length of time then test with salt; if same show a precipitate, then proceed as follows: A small quantity of salt in solution should be stirred into the drippings before the water is poured off, and until the water appears clear. Take time to do the work thoroughly. The precipitate is rich in *chloride of silver*. Add the salt gradually, stirring up the solution until

it no longer forms a precipitate, which you may easily determine by taking a sample of it in a tumbler or white bottle, holding it up to the light when adding a little salt. Don't add too much, as an excess will redissolve the chloride. When the silver is all down, pour in a little acid, either nitric, sulphuric or muriatic, which will clear the solution; allow it to stand for about twenty-four hours, then draw off your clear water and you have the chloride on the bottom of the vessel.

B. *Fixing Solutions* are very rich in silver. They should be precipitated with sulphuret of potassium, previously dissolved in water, also adding it as long as it will form a precipitate. The latter, when down, may be thrown on a plain muslin filter to allow the water to drain off. Such a filter may be readily constructed by taking a piece of common unbleached muslin, say a yard square, tying loops to the four corners, and hanging it up on sticks.

A good many photographers are in the habit of precipitating their washing solutions with metallic zinc suspended in sheets therein. The action of zinc, however, is slow, and must be accelerated by acidifying the solution. Now it frequently happens that the fixing solution is allowed to run into the same vessel, and the hypo, being an alkali, suspends the zinc. In the course of time a deposit out of the water is formed, but the happy proprietors of the "mud" are sadly disappointed in its value, as it is sometimes even so poor as not to pay for the trouble of refining. All hypo fixing-solutions may be treated together in this way. A large barrel serves as the best receptacle for them. Insert a spigot about six inches from the bottom. It has been found economical to use a large crock or stone—or it may be glass—for the negative fixing-solution; you can use a dipper with it, or let a strong strip of glass remain in and across it at an angle to prevent the smaller plates from going flat to the bottom of the vessel. Once in a while the solution may be emptied into the barrel. The precipitate which results is *sulphide of silver.*

C. *Impure Solutions and Used Baths.*—Besides salt, muriatic acid, sulphuret of potassium, protosulphate of iron, or sheet copper may be used for the precipitation of silver from any solution

very rich in silver; and they should be used, or else the solution boiled down to dryness, when the wastes are sent to the refiner. The reasons are obvious: the freight is less, and the danger of loss from breakage of bottles and leakage is insured against. See instructions for saving print washings (E). The same course may be followed here.

D. *Silvered Paper.*—All prints should be trimmed before toning, as it saves gold, and besides, toned paper is of hardly any value. Keep the untoned clippings and filters clean by themselves; do not throw sweepings, pieces of glass and spoiled ferrotype plates among them, as their bulk only decreases their value. If you wish to burn the paper, have your stove cleaned of cinders and ashes, and proceed slowly, for a good draft will carry many particles of silver through the flue. Every inch of silvered trimmings is valuable, and should be kept in a box separately. Do not tread them under foot and allow them to become mixed with dirt and dust on the floor. Keep a cover on the box, and do not allow anything but clean, untoned paper trimmings to go into it. We prefer to burn the paper, but if you attempt it, see that every bit of the paper "cinders" is consumed before the ashes are taken from the stove.

E. *Print Washings* may be treated the same as A, only it is best to keep them separate. You save enough extra to more than pay you for the additional trouble. Add the salt gradually, and watch the effect. If precipitation is slow and the solution remains milky in appearance, the addition of a little of the protosulphate of iron solution is of good service. Some workers prefer a mixed solution of salt and alum—say twelve ounces of each ingredient dissolved in two quarts of hot water—for a stock solution. Add this carefully, and not too much of it.

F. *Toning Solutions.*—Precipitate these with protosulphate of iron, but be sure and have the solution "acid," as otherwise the iron will be precipitated and your gold will be lost. Old toning-baths and the precipitates which form when the toning-bath is being neutralized by bicarbonate of soda or other alkali, should all be saved, and separately from any other wastes.

G. *Toned Paper Clippings.*—In a small business it hardly pays to save these, but where quantities are large and fuel and time are cheap, it often does. Printers for the trade, publishers of photographs, and those whose business is large, have found the recovery of gold from these clippings well worth looking after.

H. *Old and Spoiled Dry Plates* are likewise worth taking care of. The emulsion from all such can be best removed by soaking them in a strong hot solution of carbonate of soda (washing soda). When a quantity is collected, strain it through a muslin filter, allowing the solution to drain off. A stone jar is excellent for this work. After filtration the precipitate should be allowed to dry spontaneously, after which it is ready for the refiner.

I. *Barrels, Floors and Old Hats.*—It has likewise been found that the wood of barrels which contained waste solution for a number of years was quite impregnated with silver, some barrels yielding as many as thirty ounces of metal; so when yours are unfit for further use you know what to do with them.

The same discovery has been made as to the floors of long-used dark-rooms and of rooms where the paper is silvered and drained and fixed. Old felt hats are used for developer drippings by some. These with the developer, skins, fragments, and emulsion from dry plates, as well as blotters and filters, are all worth saving.

J. *Aristotype Paper Wastes* should be treated the same as other paper wastes (D). They may go together, but in everything like "waste" the *separate* plan is preferable.

K. *Finally a Word or Two.*—The end of all waste is silver and gold, if you strive to follow our advice. Dissolve the salt and iron before they are added to the waste solutions. A few drops of acid should be added to the iron solution before it is used. Any acid added to a cyanide solution will precipitate the silver. Have abundant air in circulation about you when you do this, for the fumes—*waste you.* Don't use sheet zinc for anything hereof.

Last, but not least, do not send small lots of waste to be refined, but wait until you have a reasonable quantity, for expenses and charges are then comparatively less.

THE WORLD'S CONGRESS AUXILIARY.

THE photographic congress of the world's congress auxiliary at the Columbian Exhibition was opened by the chairman, James B. Bradwell, on August 1st, 1893, by the following address:

Photographers of the World's Congress Auxiliary:

LADIES AND GENTLEMEN:—It is perhaps not out of place for me, representing the committee on the Congress of Photographers that called you together and selected the persons to present papers for your consideration and discussion, to say a few words (not of welcome, for this is your Congress, but relating to the Congress itself).

Fifty-five persons, representing Europe, Asia, Africa, America, and the Islands of the Sea, have accepted invitations to prepare papers and deliver addresses upon photography and the processes dependent thereon. Twenty addresses from persons whose residences are so distant that they are unable to attend the Congress, have been received by the committee, and will be read and discussed. The other addresses will be delivered by the authors in person. This is an age of illustration, and it has come to stay. Not the illustration of the old wood cut with which the spelling books and readers of our youth were thought to be adorned, but of the beautiful silver print, the photogravure, the life-like halftone, and other light-printing processes.

The program presents a great variety of talent and subjects:

"Color Photography" is represented by Fred E. Ives, its ablest exponent in America; "Isochromatic Photography," by G. Cramer, and "Orthochromatic Photography and Its Practical Application," by John Carbutt, once a Chicago photographer. These gentlemen are the proprietors of two of the most extensive dry plate establishments in the country, and will do their subjects ample justice. "Photography in Natural Colors," by the eminent artist, Edward Bierstadt, of New York. "The Present and Future Possibilities of Photography" has been assigned to the enthusiastic W. I. Lincoln Adams, of the *Photographic Times*,

and to Leon Vidal, an eminent artist of Paris and professor at the National School of the Decorative Arts. "Winter Photography in the Alps" is aptly treated by Elizabeth Main. Dr. John Nichol, of the *Photographic Beacon*, well known both in America and Europe as an able writer and skillful photographic artist, still holds his subject within his photographic breast, but we have no doubt it will be entitled, "Words of Wisdom from the Watch Tower." "Amateur Photography" was very appropriately selected by Miss Catharine Weed Barnes (now Ward), and "Photographers' Efforts at Union" as appropriately selected by H. Snowden Ward, of London, England, and in the light of Mr. Ward's efforts at union we have no doubt his paper will be exceedingly interesting. "Electric Lighting in the Studio" has a skillful exponent in Henry Vander Weyde, of London, England. "Portraiture" is treated by Shapoor N. Bhedwar, of Bombay, India, in an exceedingly able and interesting manner. "Posing and Illumination," by E. M. Estabrooke, of Elizabeth, N. J., will well repay a careful examination. "The American Bibliography of Photography" is to be treated by C. W. Canfield, of New York, an able and experienced photographic writer.

"Photography Applied to Scientific Research," by Prof. Romyn Hitchcock, of the Smithsonian Institute, will be a paper of lasting value. "The Finer Division of the Silver Haloids for Scientific Work," by Thomas W. Smillie, of the Smithsonian Institute, will be of unusual interest to the scientific photographer. "The Hand Camera—Its Aims and Objects," by Walter D. Welford, of London, England, will be instructive to all not skilled in the use of this instrument. "Film in Relation to Amateur Photography," by Gustave D. Milburn, of Rochester, calls attention to a matter not generally known in relation to films when rolled. "The Camera as a Source of Income Outside the Studio," will be treated by Mrs. Elizabeth Flint Wade, of Buffalo. "America's Share in the Development of Photography" will lose nothing at the hands of Julius F. Sachse, editor of the AMERICAN JOURNAL OF PHOTOGRAPHY. "Carbon Printing" has been assigned to W. A. Cooper, one of Chicago's oldest and most expert process workers. "Fine Line Screens and Their Use,"

by M. Wolfe, of Dayton, who was not the first to discover their use, but was, we believe, the first in America to make them publicly an article of merchandise. "Photo-Mechanical Processes in England" receives the attention of W. T. Wilkinson, the author of a work on Photo-Engraving. The beautiful process of photogravure has been selected by the artistic and well-known Ernest Edwards, of New York, and Photo-Mechanical printing up to 1893, by Professor Jacob Husnik, of Prague, Austria, author of four works on mechanical printing.

The learned professor expects to surprise Americans. We have no doubt he would be surprised if he could be present and hear the discussion that his paper will occasion. America is not behind the age in either photography or process work. "Support Reflection—Its Sources, Its Effects, Its Remedies," is to be treated by I. T. Sandell, of Thornton Heath, England. There have been so many improvements in photographic lenses recently that anything upon this subject by scientific and practical men is of interest to all photographers. "Tele-Photography" will receive the attention of Edward Bausch, of Rochester. The address of Thomas R. Dallmeyer, of London, whose name is known wherever photographic lenses are used, arrived but yesterday, and its title on the program should be changed to "Tele-Photographic Systems of Moderate Amplification." "Recent Improvements in Photographic Lenses," by Professor W. K. Burton, of the Imperial University, of Tokyo, Japan, is upon a subject of much interest, and will rank high among the able papers of the Congress. "Photography as an Aid to Education" will be demonstrated by Professor Charles F. Himes, of Dickinson College. "The Camera and the Pulpit" will be the subject of a discourse by Rev. A. W. Patton, of Joliet. M. A. Seed, maker of the celebrated dry plates that bear his name, will speak of coarse-grained negatives, and tell how to prevent them. Mr. Ellerslie Wallace, of Philadelphia, has a very readable paper upon medical photography in general. "Photography in Surgery," I am pleased to say, will be treated by a woman, Mrs. Dr. G. F. Sears, of Chicago.

In this connection I may be permitted to say that in all the departments of the Photographic Congress, men and women are upon an equality. Notwithstanding the continued efforts of Mrs. N. Gray Bartlett, chairman of the woman's branch, and the entire committee, but five women have been found in Europe and America to accept invitations to deliver addresses.

"The Sensitiveness of Photographic Plates" is the subject selected by the cautious and accurate Professor G. W. Hough, of the Northwestern University. Andrew Pringle, of London, is to tell of "The Services of Photography to Medicine." "Negatives for Lantern Slides and Enlargements" is the subject of F. A. Bridge, Hon. Secretary of the Photographic Club, London. "Marine Photography" is assigned to one of its ablest exponents, Henry G. Peabody, of Boston.

"Photography for Illustrating the Practice of Medicine and Surgery in a Great Hospital," by Professor O. G. Mason, of Bellevue Hospital, will interest not only photographers, but all who are in the practice of medicine and surgery.

"Photography as Applied to Medicine," by Professor Albert Londe, of Paris, is a paper of great scientific value and interest. "Photography as Applied to Surgery," by Professor A. S. Murray, of Johns Hopkins Hospital, is a practical paper. The beautiful landscapes of Colorado, taken in the pure air of the mountains, will receive the attention of W. H. Jackson, of Denver.

The paper of W. Jerome Harrison, of London, contains valuable suggestions as to the desirability of establishing an International Bureau to record and to exchange photographic negatives and prints. I would recommend that this paper be taken up out of its order, read, and referred to a committee with instructions to consider whether some plan cannot be adopted to carry out the suggestions. "Photography Without a Lens" is illustrated by Captain R. Colson, of Paris. "Universal Standards in Photographic Apparatus" is to be advocated by Henry Sturmey, of London. "The Latent Image" has been selected by Miss Adelaide Skeel, of Newburgh, as her theme. In brief, this is a portion of the literary bill-of-fare which has been prepared for your consideration.

In view of the great number of papers and the shortness of time I would recommend that the reading of no paper be allowed to occupy more than twenty minutes, and that in discussing questions relating to the papers no person be allowed to occupy more than five minutes. Suggestions following the reading of a paper are often more valuable than the paper itself.

Can we estimate the value of portrait photography better than to ask, what would a photograph of Columbus be worth to-day, if it could be produced of him as he landed upon our shores four hundred years ago? Are his portraits satisfactory? We may admire the work of the great masters of the past and the portrait painters of the present, but no human hand can equal the sunlight of the Almighty, for reproducing the life-like and accurate features of the human form. We depend upon photography to give us pictures of our friends as we see and know them now. Is there any art or science upon which so much depends as photography? The newspapers, the magazines, and the books of the world are illustrated by its aid. The astronomer, the surgeon and physician, the architect, the engineer, the minister, the lawyer, and the judge in the administration of justice, all, more or less, are aided by photography.

The object of this Congress is to bring together the photo and the photo-mechanic artists of the different countries in the world to compare views and methods, and profit by the experience of each other.

The scientific men of the world are at work to develop and perfect photo-mechanical art, and such rapid progress is being made that the man who is in the front rank to-day may find himself in the rear to-morrow. The slow wet photo process, once universal, has given place to the rapid dry plate, except for process work and lantern slides. Some claim for half-tone work that a slow, dry plate is even better, and gives a truer reproduction. The asphalt, the swelled gelatine, and the wash-out gelatine processes, once so popular, have almost passed into disuse. The half-tone etchings on zinc once in general use for fine book and magazine illustrations have very generally been superséded by the fine half-tone enamel copper process. This is undoubtedly

the best and cheapest process, all things considered, up to date for fine book illustrations, as the blocks work nicely with type, and when properly made may be used to make electrotypes.

Blocks made by this process with a coarse line screen and deeply etched may be run upon a country cylinder press where common news print paper is used and poor ink.

With few exceptions the world over the great dailies use the old wet-place process and the etching in line upon zinc for purposes of illustration. I look forward to the near future when the half-tone process will be generally used by our great city dailies.

Half-tone blocks may be made without etching by taking a slow dry plate, exposing it under a line screen, and after development subjecting it to heat, and placing it in a chemical solution. An electrotype may be made from this negative, which will have all the relief required to run on the printing press. In fact the dry plate half-tone negative itself thus treated may be cemented to a wooden block and run on the printing press with type within an hour from the time the exposure was made on the photograph to be copied.

I have no doubt there are those within the sound of my voice, who will live to see the time when photographic reproductions will be sent from country to country as quickly as we do telegraphic messages to-day.

W. Jerome Harrison says: "The international photographic survey of the heavens has now been in progress for six years; some thousands of negatives of the stars have been obtained, and when this survey is completed, the present face of the sky will be known with an accuracy which the astronomers of a pre-photographic age never dreamed of."

In conclusion, may I not ask, who shall say that the camera, adjusted by the hand that feels, and focused by the sensitive eye that sees beyond, with the aid of intensely sensitive dry plates, shall not bring to light and view the forms of our departed friends and solve the problem of immortality and life.

Aristides of Thebes was, according to Pliny, the greatest ancient master of expression.

ISOCHROMATIC PHOTOGRAPHY.[1]

G. CRAMER.

AMONG the great discoveries and achievements that characterize our present century and have acomplished results never before dreamed of and formerly deemed impossible, photography holds a prominent place in practical utility and as a helpmate to art and science.

Portraiture has been brought to simplicity, and in the fraction of a second we can secure the features of those who are dear to us. Foreign countries and nations are brought to our sight in pictures produced by the camera; movements of animals, too quick to be distinguished by the human eye, are truly and accurately recorded by the highly sensitive photo dry plate; the stars are photographed, as well as the minute bacilli and bacteriae whose multitudes inhabit the drops of water and the cells of animal life, and which in many instances are the causes, heretofore unknown, of diseases.

Since photography has rendered it possible to secure the rays of light to the sensitive plate it has been the aim of scientists and practical workers to bring it to perfection, and the greatest improvements have been achieved in the preparation of dry plates ready for use and of the utmost sensitiveness. The great desideratum, to obtain photographs in natural colors, is now brought in the reach of possibility, as shown by the fine specimens of reproductions which are on exhibition in the photographic department of our great World's Exposition, and the time may not be far distant that portraits and landscapes are photographed in all the beautiful tints and colors as seen in nature. The most important step in this direction was the production of color-sensitive plates, by which one of the shortcomings of photography is corrected, that is, the insensitiveness of the ordinary plates to the yellow, orange and red colors, which causes these colors to appear much darker, while the blue and violet appear much too light in the ordinary photograph.

[1]Read at the Congress of Photographers, held at Chicago, in August, 1893.

The aim of isochromatic or orthochromatic photography is the production of plates equally sensitive to the different rays of the spectrum, so that in the monochrome of the finished picture all the colors are rendered equally correct in their respective values.

This color-sensitiveness is obtained by the addition of certain ingredients, mostly of the eosine group of aniline dyes, to the sensitive bromide of silver emulsion, and the plates so prepared are called isochromatic or orthochromatic plates.

A great drawback to the introduction of the isochromatic plates into general use has been the necessity of a color screen in order to obtain the isochromatic effect. A yellow glass had to be placed before or back of the lens, or a yellow pellide in place of the diaphragm to filter the light and to subdue the greater actinic power of the blue and violet rays. The isochromatic effect being increased in the same proportion as a screen of deeper yellow color is used, it necessarily follows that the required exposure is prolonged in the same ratio and to such a degree that the use of a color screen for portrait work and instantaneous exposures is out of the question. If the yellow screen is not perfectly even in structure and thickness, and absolutely plain, it will cause distortion of the image by aberration. Change the chemical focus and reflection may also be caused by its use, and therefore it is apparent that plates which produce the most isochromatic effect without the aid of a color screen are the most valuable.

As such plates can now be obtained which combine great rapidity with good color-sensitiveness, and are no more difficult to work than ordinary plates, their advantages should be appreciated by the photographic fraternity.

In portrait photography the blue eyes and auburn hair are rendered more truthfully, imperfections in the complexion, such as freckles, are less noticeable, and dresses of any color are photographed correctly, so that ladies need do longer consult the photographer as to what color of dress to wear when having their pictures taken.

In landscape photography the main advantage of the isochromatic plate is that distant objects are photographed much more distinctly than with the ordinary plates. A slight haziness in the

atmosphere is neutralized by the use of isochromatic plates, while an ordinary plate would not produce any satisfactory result under the same circumstances. White clouds in a blue sky cannot be photographed except with the isochromatic plates, and how much clouds add to the beauty of a landscape is known by everybody.

In sunset scenes the superiority of the isochromatic plates is as apparent as in the autumn landscapes with their wealth of yellow and orange-tinted foliage.

In landscapes or marine views the horizon is not lost, water and sky being properly rendered.

In commercial photography the instances where isochromatic plates should be used are too numerous to mention. Wood work, which is generally of a yellowish tint, is photographed more perfectly; inscriptions on wagons, railroad cars, samples, floral designs, etc., etc., which may not show at all when photographed with an ordinary plate, are perfectly reproduced.

Now, for the copying of paintings in oil or aquarelle nothing but an isochromatic plate should be used, and its advantage for this class of work is most strikingly apparent. In an old oil painting the lights are generally yellow, while the half tones are of a bluish tint. It is impossible to obtain a good copy of such a painting with an ordinary plate. Plates of full isochromatic effect are necessary for this purpose.

Another advantage of the isochromatic over the ordinary plate is its greater sensitiveness when the light is yellow, as is frequently the case in fall when the sky is cloudless, or in photographing by gaslight.

I have now said enough of the advantages of isochromatic plates, and beg to be excused if I have made statements of facts supposed to be well known; but the isochromatic plate being undoubtedly the plate of the future, it seems to me that its full value should be more generally understood and appreciated.

The best examples of Christian art during the first three centuries are in the catacombs of Rome.

ORTHOCHROMATIC PHOTOGRAPHY AND ITS PRACTICAL APPLICATION.[1]

JOHN CARBUTT.

IT is very evident that the prominence given to orthochromatic photography at this World's Congress of Photographers reflects the growing interest in the use of color-sensitive plates, not only to produce monochromatic results from nature and the production of the artist, but a close realization of that long-sought desideratum—photographs in the colors of nature.

Since the first intimation by Col. Waterhouse for the use of dry-eosin in collodion to overcome the inability of the collodion process to render other than the blue and violet rays of the spectrum, scientists have worked assiduously to overcome the difficulties that were inherent in the old wet, and the dry plate process of the present, and to no one are we so much indebted for the present success in orthochromatic photography as to Dr. Hermann Vogel of Berlin. We owe also much to the research of Mallman and Scolik of Vienna, Bottamly of England, and others we might mention, who by their liberal contributions to the literature of orthochromatic photography have done much to aid those who have made it their business to produce commercially the plates for the photographers' use.

The dyes now generally used, either by mixture with the emulsion before coating the glass plate or celluloid film, or dyeing the ordinary gelatine plate afterwards, are eosine, erythrosine, rose bengal, and cyanine,—the latter we believe but rarely used, owing to the unsalable character of the plates made with it. To the above may be added axaline, a compound of Dr. Vogel's invention, said to consist of chinoline red and cyanine blue.

Orthochromatic photography has had its greatest advocates in Germany and Austria in the reproduction of works of art in monochrome. Since the introduction by myself, in 1885, of orthochromatic plates, the use both by the amateur and professional photographer has had a steady growth. The intelligent

[1]Read at the Congress of Photographers, held at Chicago, in August, 1893

amateur, as seems to be always the case on the introduction of any improvement in photography, was the first to test its merits, then the professional copyist of art works took hold of them, and their results now vie with the best products of Europe.

The professional photographers of America were the last to take hold of and use the orthochromatic method, and the wonder to me is that they are not more used by them. One reason is, I believe, a want of acquaintance with the orthochromatic plate, and with many the idea prevails that a color screen must be used under all circumstances; this arises, it seems to me, from an unwillingness on the part of photographers to read the literature provided for them on the subject, which, if read, would make many things plain that they remain in ignorance of, and as is often the case, lose business for want of the little knowledge so easily acquired.

It is, however, very pleasant for me as a manufacturer of orthochromatic plates to say that, since 1891 the increased use of these plates has been very large as compared with the time from their introduction in America up to that date.

The color sensitive plate may be used under all conditions where a plain bromide plate has previously been employed. Its use is to harmonize contrasts, whether in the dress of the sitter or a view from nature. Greens and yellows are rendered with more detail and color value, while blues and light reds in drapery are given their proper color value, instead of being rendered lighter in the photograph, as is common on the ordinary gelatine plates.

THE COLOR SCREEN—WHEN AND HOW TO USE IT.

For ordinary landscape work a very light yellow screen is all that is necessary; a dark yellow or one of orange shade would falsify distance. The most suitable place for the color screen is at the back of the lens board, sliding it in two groved cleats, and should be placed in position when focusing. A screen of such a tint as this one would require an increased exposure of four to six times, depending on the state of the atmosphere, the yellower the light the shorter the exposure, and towards evening may be dis-

pensed with. The value of a light yellow screen is best shown where the vista is slightly hazy, or where the clouds are included in the view. Their outlines and forms will be much better rendered in the negative.

USE OF SCREENS IN COPYING PAINTINGS.

In this class of work the selection of the proper color screen is of more importance than in landscape work, and the photographer should be provided with two or three, ranging in tint from a moderately strong yellow, medium and dark orange. Paintings are best photographed in direct sunlight, and by examining the painting through the color screen it will not be difficult which one of the screens to select. For instance take a modern French painting, consisting of light and brilliant colors—a yellow screen will answer, but with a German or English painting, containing strong reds and dark blues and green, we would select an orange color screen, and correspondingly increase the time of exposure. It may astonish some of you to learn that as much as ten minutes' exposure is given in direct sunlight on paintings that are old, or painted in strong colors.

PHOTOGRAPHY IN THE COLORS OF NATURE.

The objective point that has been striven after for years seems now near being accomplished. I do not mean the actual photographing of either objects or nature in colors, but through and by the agency of the orthochromatic plates. By the patient and scientific research of Dr. Vogel of Berlin, and Frederick E. Ives of Philadelphia, the first as achieved by triplicate negative and a like number of superimposed impressions, reproductions of objects in color so true to the originals in color as to be quite a commercial success, and in this country is being carried out by Mr. Kurtz of New York. Of Mr. Ives' work I have seen a great deal; it differs in result from that of Dr. Vogel's, in that the final picture is a triple image—a positive—on glass, viewed through three color screens in an instrument invented by him, called the Heliochromoscope, and the object as viewed is seen in all of nature's brilliant coloring.

Color photography—so called, is now achieved by making three negatives of the object on orthochromatic plates through three different color screens, viz: Violet, green and red. I have here samples of such color screens. In printing by the colotype, or half-tone block, as in Mr. Kurtz's work, inks in the three primary colors are used, viz.: Blue, red and yellow. The proper selection of tints, however, is a very important matter. Reproductions by this method are shown in Mr. Kurtz's exhibit in the gallery, north end of Liberal Arts building.

DEVELOPING OF ORTHOCHROMATIC PLATE.

The same developer as used for the plain plate may be used for the color sensitive plate, except that we find it best to use it slightly diluted; as the color sensitive plate more readily takes on density, and the exposure should always be generous, it is necessary in order to get full color values.

KEEPING OF ORTHOCHROMATIC PLATES.

A certain amount of doubt as to the keeping qualities of orthochromatic plates has been disseminated in this country. I can only say with regard to those of my own make, that I have evidence of many cases where they have yielded perfect results from nine months to a year and more after leaving the factory. Plain plates orthochromatized by the bathing process, writers tell us, are not to be depended on over a few weeks. From past experience I am led to believe that plates from a proper orthochromatic emulsion have as good keeping qualities as the plain plates from same emulsion.

In conclusion I may say that I am firm in the belief that color sensitive plates will in time replace the plain bromide plates as the latter has the old wet collodion.

Cobaltic Salts.—A patent has been taken out in England by the Messrs. Auguste and Lumiere, of France, for the employment of Cobaltic salts to obtain photographic images.

"COARSE-GRAINED NEGATIVES."—HOW TO PREVENT THEM.[1]

M. A. SEED.

IT is an acknowledged fact that there is a difference between the grain of a highly sensitive plate and one of a lower degree of speed, but from experience I have found that this difference need not be so great as is generally supposed unavoidable.

Extreme care in the manufacturing of the emulsion is necessary to prevent it. Without this great care there may be great sensitiveness, but there will be great coarseness. From such a plate it is impossible to get a fine-grained negative, but it is possible to get a coarse-grained negative from a fine-grained plate.

After years of observation I have noticed that as a rule photographers make a better class of negatives during the cooler months than through the hot season. The grain of the negative is finer and the general appearance cleaner. The reason may appear obvious. Use ice, some one will say, and all the difficulties will be overcome. The suggestion is good, but it does not fill all requirements. The negative may appear without fault up to the time of putting on rack to dry, and still when you examine it after drying it does not possess the quality you expected to find. The reason is that during the sultry days of the summer the drying of the negative takes several hours, the gelatine film becomes partly decomposed, allowing the particles of silver bromide to come together, they having an affinity for each other, the sack of gelatine which kept them apart being partially destroyed, forming coarse particles. The negative has then a woolly appearance.

All negatives have the finest grain and appear the cleanest immediately after fixing. What we want is to retain this quality when dry. How shall it be accomplished during the hot season when everything is warm and the drying so prolonged? My method is as follows:

I have a small ice box for my developer made like this: [Illustration omitted] in which are the two stock solutions. When I

[1]Read at the Congress of Photographers, held at Chicago, in August, 1893.

mix the developer, I take enough ice water to bring it to about 60 degrees Fahr. I first rinse out my tray with ice water, then develop the plate; the fixing bath also is kept cool. If the water I fix my negatives with is too warm I simply rinse with it and allow the negative to soak in cool water in a grooved box about one hour, changing water two or three times. Then I rinse once more and put on rack to dry. Between this point and the time when the negative is perfectly dry, it is liable to injury during the summer months when the atmosphere is 90 degrees or over and often very humid, taking eight to ten hours to dry perfectly, thus changing the density and producing coarse grain. I have seen negatives that were developed, fixed and washed in the evening, having wet patches on them the next morning. They were taken to another room to perfect the drying. The consequence was, when the drying commenced to be more rapid, there was at once a change of intensity, ruining the whole lot.

It is important, therefore, that the negative should dry as quick as possible, in as cool and clean air as can be had. The best arrangement I have seen for this purpose, is now being used by one of the most eminent photographers in this country, Mr. M. J. Steffens, of Chicago. It is a small electric fan by the use of which the negatives can be dried in half an hour or less. Connection is made to a sixteen-candle lamp wire.

Just a word more as to another cause of coarseness. It may be produced by using a developer too strong in alkalinity. A strong alkali has the same effect upon the film as less soda with heat.

Ruthenium Red.—The color discavered by M. Joly in his researches on the ruthenium ammoniacsl compounds rivals the most brilliant coal tar pigments by its tinctorial intensity. The author has observed thrt ruthenium red is the best reagent for the pectic compounds, which are always associated with cellulose in young tissues, and in old tissues which have not been modified by foreign matters. It is the only reagent for the transformation products of the pectic compounds, *i.e.*, the majority of gums and mucilages.—*Louis Mangin.*

SAFE DARK-ROOMS.

BY XANTHUS SMITH.

A FACT which came under our observation recently in connection with the dark-room and development brings afresh strongly to our mind the importance of the most scrupulous care in regard to the security of the dark-room against the leakage of light, and as to the character of the non-actinic light admitted.

One great beauty of the old wet-plate negative was its perfectly clear shadows, which in the very deepest portions appeared as clear glass. We all know how careful it is necessary to be to approach this quality in working the dry plate, especially the highly sensitive brands, either the slightest veiling or discoloration, to which they are so prone, subduing more or less the brilliancy of the resultant work.

A friend, who, by the way, is a careful worker and highly skilled in the art of photography as an amateur, showed us lately a clear proof of how he had been deceived in the character of his light, an argand gas jet with a ruby chimney. Having developed a number of portrait negatives, in which the sitter had been posed against a black background, he found upon completion a distinct impression of the ends of his fingers, where they had shielded the light in holding the plates up for examination by transmitted light during the progress of development. Of course in most ordinary work, and especially in lanscape views, this would not have been detected, but in the case of the clear black background it was observable at once.

The lighting of so-called dark-rooms is a matter of extreme importance. More so for the professional than for the amateur photographer. Because the latter and his employees must occupy it a greater portion of the time, and that it may be amply lighted and with a character of light which shall be safe for the most highly sensitive plates and films, and at the same time have thorough ventilation, it is obvious that careful observation and construction are necessary. But with the subject of the lighting of dark-rooms for professional photographers we will have

nothing to say, because the professional men are all supposed to be sufficiently well posted in their business to have the best arrangements that are to be had, if they be progressive, and if they are of the careless or old wet-plate men, used to plenty of actinic light, it would be of little use to talk to them.

For the amateur, however, of whom there is a constant incoming of recruits, there cannot be too much attention called to the importance of securing a safe place for the handling and development of sensitive mediums. That there is a stealthy deterioration of those brilliant shadows, which it is so difficult to maintain, and which give such crispness and force to the finished print, in so many instances, there can be no doubt. Such deterioration is likely to take place during the time of changing the plate holders, of transferring the plates from the holder to the developer, and of the examination by transmitted light; for, perhaps except with the first plate, the developing solution soon enough assumes a discoloration sufficient to act as a complete protection while the plate is immersed in it, and on account of the security that we have always felt in this protective influence of the developer, we have considered it safer on holding the plate up to the light for examination by transmitted light to expose the film side rather than the glass side to the light.

The dark-room for the majority of amateurs must be an extemporized place, either bath-room, large closet, or perhaps the space under a stairway, and, fortunately, out of these seemingly unsuitable places a very great amount of comfort may be had in the actual work by a little attention to a few simple matters. For instance, if an opening of about 8 by 10 inches can be cut so that it will come just above the table or shelf upon which the developing is done, and a plate of dark ruby glass inserted in this, care being taken that no light can leak in around it, and a lamp placed on the outside, all the annoyance of the heat and smell connected with lamp or gas in the dark-room is got rid of, and what is more, all danger is obviated of fogging from streaks of actinic light leaking out above or below the ruby shield. Another important matter is that in most cases the larger room into which your developing closet opens may be

darkened during the times that you are at work by curtains or pinning up shawls, if there are no blinds, to a sufficient extent to permit of the fixing and washing being carried on safely in it, thus obviating the necessity of being long shut up in the small space of the closet, and besides, this renders the dark closet safer from leakage of white light in working in the daytime, and is of advantage also in avoiding a too sudden transition from the subdued light of the dark-room to a strong light which is more or less injurious for the eyes.

There are many advocates of plenty of light for the dark-room, and that is probably the best way to have it. But great care must be taken that there is not some fatal crack or pin-hole, ever so small, that is constantly doing havoc for you. Take, for instance, a bath-room with large window, perhaps facing south; you fasten up all the cracks, as you think securely, paste yellow office paper over the panes of glass, and cover the whole with a ruby fabric curtain, and work away in apparent security, but as your room is always light enough to see everything that is in it during the daytime, how do you know positively that it is entirely secure? If you find it more desirable to use a small ruby pane, which you may work quite close up to with perfect safety, shut it off by fastening something against it on the outside, go into your dark-room and close the door, and remain there five minutes or so until the eyes have become sensitive to light, and you will then know whether you have positively excluded all light or not. We have sometimes, as we had supposed, attained absolute darkness in an apartment, but after remaining in it for some time found that we could see everything in it pretty distinctly.

It is true enough, as we sometimes hear it stated, that plates are not so easily fogged, and we have had frequent experience of having more or less white light in the dark-room with plates in various ways to be ruined as might be supposed, and they have apparently not suffered, but these cases must be taken as the exception and not as the rule, and it is far safer to avoid the risk.

We must think of the time and money and enthusiasm and often fatigue incident to securing a lot of exposed plates, and

weigh this against a little trouble bestowed upon making the place in which the sensitive plates are to be handled absolutely safe against fog.

It will be found to be of great advantage to screen the ruby light from the eyes while developing. It is such a difficult matter to tell definitely what progress the image is making when great refinement is sought after, that every means should be made use of that will prove an aid to the work.

One decided advantage in lamp light development is that you can regulate so readily the amount of light to suit the character of the plates which you are using. With day light it varies so much from sunshine to dark cloudy weather, and, perhaps, under the latter condition you may be using slow plates. With a bat wing burner and a dark ruby glass you can have just as little or as much light as you wish with perfect safety. But beware of an argand burner with a ruby chimney, as you may be using a much more actinic light than you suppose.

A dark-room may have a very large amount of safe light in it, so that everything can be gone about in comfort in any part of it and yet in such a dark-room it may be exceedingly difficult to determine to a nicety the progress that a plate is making, whereas with a small concentrated light in a really dark room we may get a much clearer impression of the image in its various stages, both by reflected and transmitted light, than we can when developed in a dim light.

We have spoken of ruby light as the non-actinic light, our remarks referring more to the placing and use of the light, and dangers of admission of white light, than the exact character of the non-actinic light to be used. This must depend somewhat upon the taste of the operator, and experiment may incline him to dark ruby alone, or a combination of red and yellow, or the addition of cathedral green, and, in fact, he may find it necessary to vary the shades of color to adapt his light to the nature of the different orthochromatic mediums which are coming into extensive use.

ULTRA-VISIBLE MEASUREMENTS.

THE micron—now the general standard of measurement among microscopists—is a length of 1-1000th part of a millimetre, or about 1-25400th of an inch, and this is the unit with reference to which the dimensions of light-waves are usually expressed. Thus, the wave-length of yellow sodium light corresponding to Fraunhofer's absorption line D is ·5888 micron; the line B (in the red) corresponds to ·6897, and the line H (in the violet) to ·3963 micron, or, as often written, ·3963 μ. The brown specks on the frustule of the *Pleurosigma angulatum* (or, *Gyrosigma angulatum*) are separated by a distance from centre to centre of from ·64 to ·65 of a micron, and these form one of the commonest of microscope test-objects. But vision with the microscope is, of course, in one sense an optical delusion, and we are in need of something, by way of illustration, which appeals more directly than this to the understanding, if not to the unaided eye, so that the minute measurements with reference to which the true constitution of matter has to be described, and by the aid of which all the processes of physical optics must eventually be explained, may be somewhat more readily or more fully appreciated.

In a recent communication to the Royal Dublin Society Dr. G. J. Stoney makes a very interesting and instructive suggestion as to a standard gauge which might be applied to the purpose we have referred to. He imagines a wedge-shaped gauge with a base line 10 metres long, having a micron erected at one end of it, and from the top of which an inclined plane is drawn to the other end. It is in fact a wedge with a slope of one in ten millions. Now suppose this gauge prolonged beyond the 10 metres. At a distance of from 70 to 80 metres from its apex—about as far as street lamps are from one another—the ordinates would correspond with the diameters (7 or 8 microns) of the red corpuscles in human blood; at two kilometres distance (over six miles) the ordinate would become exactly one millimetre; and to reach an ordinate as long as one inch we should have to go to

a distance of 254 kilometres, or 158 miles from the apex. Still further to extend the gauge which is imagined, and picture the extreme acuteness of its angle, we may describe it as a triangle which has a base of one metre and sides of the length of a quadrant of the earth's meridian. The angle included by the inclined gauge lines is, in fact, between 1-48 and 1-49 of 1″. Having thus defined Dr. Stoney's gauge sufficiently clearly we may confine our attention to the first mentioned 10 metres which are next to its apex. Angström's map of the solar spectrum, being based upon a scale of millimetres, can be laid down upon the gauge in such a manner that the positions 4,000, 5,000 and 6,000 upon the map shall coincide with points at distance of 4, 3 and 6 metres from the apex. And when this is done the actual length of λ (the wave-length in air) for each ray represented in the map, is that ordinate of the gauge (*i.e.*, that vertical distance from the base of the gauge up to its sloping top) which is immediately over the line of the map representing the ray. Each millimetre division on this gauge or spectral map corresponds to a difference in the wave length, or ordinate, of one ten-millionth of a millimetre. This ten-millionth of a millimetre itself measures the ordinate of the standard gauge at a distance of only one millimetre from the end. But with one of Prof. Rowland's gratings, double "lines" have been resolved in which the separation of the constituents is not more than one-hundredth of a millimetre on Angström's scale. This, which is the smallest measurement that has yet been directly effected with certainty, corresponds with the ordinate of our gauge at a distance from its apex which is little more than the diameter of a single blood corpuscle.

The iridescent strata which can be photographically produced by stationary waves of light, and which it has been proposed to utilize in the production of diffraction gratings, are separated from one another by distances lying at from two to four metres from the apex of Dr. Stoney's scale. As for the *minimum visible* (*i.e.*, not the smallest point that can be seen—a thing which is thus far without meaning to us—but the smallest separation at which two points may stand consistently with the possibility of their

being "resolved" microscopically) this is situated between two and three metres from the apex. To the unaided eye, we may add, *minimum visibile* subtends about half a minute at 25 centimetres, and would lie, as an ordinate, at a distance of no less than 240 metres from the apex of the gauge. The mean free path of the gas molecules in air is represented at a distance of about three-quarters of a metre (say 30 inches); the average *spacing*, or distance between the centres of air molecules, at perhaps about 1 centimetre; and the spacing in the highest vacua as yet attained in the manufacture of glow-lamps at *only 1 metre* from the same point of reference. For the so-called diameter of a gas molecule—that is to say, the distance within which the centres of two molecules must come in order that they may sensibly deflect each other's path, we must set up an ordinate of about 1 *millimetre* from the apex of the scale. Scarcely even an approximate estimate has been made of any corporeal magnitude lying more remote in its minuteness, from the sphere of our direct experience and apprehension than does this. The free path of the intra-molecular particles, by the oscillations of which light-waves are generated, may be—and, in Dr. Stoney's view, are—very much smaller than the diameter of the molecule itself. But the only way in which this free path or orbit can be guessed at is by assigning a superior limit to the velocity of intra-molecular motion, remembering that such velocity bears to the velocity of light the same ratio as the intra-molecular orbit, when radiation is at the maximum, bears to the length of the wave. As a basis for such calculations, in connection with the air molecules of which the diameter has been given, light of the wave-length .4 μ may be taken, which has a period of 600 million vibrations per second.—*The Optician.*

English Patents.—Among the new patents lately granted in Great Britain, there is one for an improved apparatus for calculating photographic exposures, another for the production of photographs on slate, and one for a new cross motion for the front boards of field cameras.

ROBERT CORNELIUS.

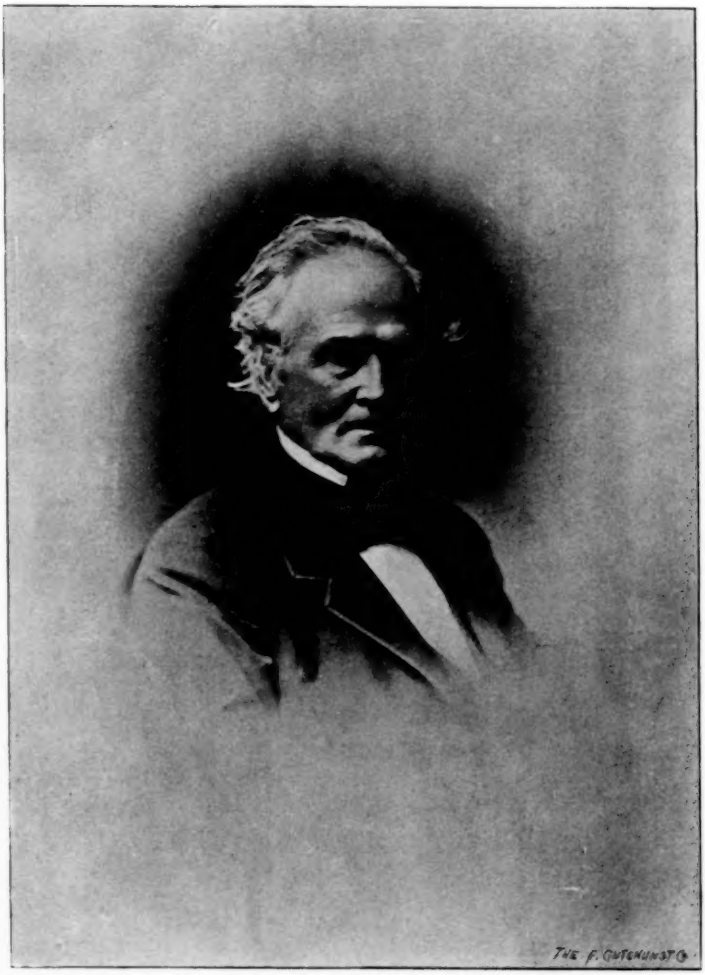
THE death of Robert Cornelius at his country place above Frankford, near Philadelphia, on Thursday, August 10th, 1893, removed an old and at one time well known resident of the city. He was born in Philadelphia, March 1st, 1809, and after receiving an ordinary school education, early in life entered the business of his father, Christian Cornelius, a native of Holland, in the manufacture of lamps.

In the year 1839 he became acquainted with Daguerre's process through Joseph Saxton and Dr. Paul Beck Goddard, who perfected the system by which portraiture became possible, and contracted with Mr. Cornelius to construct their experimental apparatus. A few months later (February, 1840), in connection with Dr. Goddard, whose name was not known to the business, he opened the first studio for photographic (Daguerreotype) portraiture in the world at the northeast corner of Eighth Street and Lodge Alley (now Jayne Street). He had previously, November, 1839, obtained the first portrait made under this process.[1] He is also credited with publishing the first photographic advertisement in the history of the art, which appeared in the Philadelphia *Public Ledger*. Mr. Cornelius retained his studio until 1843.

Upon the introduction of gas he devoted his entire time and energy to apparatus for the new illuminant, and the firm of Cornelius & Co., consisting of Christian and Robert Cornelius and Isaac F. Baker, a son-in-law of Christian, began the manufacture of gas fixtures, in which business Robert Cornelius continued, the firm name changing to Cornelius & Baker and Cornelius & Sons, until 1877, when he retired. In 1851 Mr. Cornelius bought a country place above Frankford, where in the latter years of his life he occupied leisure time experimenting with seeds.

The deceased was more than fifty years a member, and a large portion of the time an Elder of the Presbyterian Church, taking

[1] AMERICAN JOURNAL OF PHOTOGRAPHY, July, 1892.



ROBERT CORNELIUS.

PROPRIETOR OF THE FIRST ROOMS OPENED FOR DAGUERREOTYPE PORTRAITURE IN THE WORLD, PHILADELPHIA, 1840.

NEGATIVE BY F. GUTEKUNST, JUNE 1876.

an interest as a member of the committee which took active measures towards the successful reunion of the old and new school branches of that church.

He was a member of the Franklin Institute, Pennsylvania Horticultural Society, American Pomological Society, and one of the early members of the Union League of Philadelphia.

His funeral services were held at the Presbyterian Church at Frankford, on Monday morning, August 14th, 1893.

The portrait which we reproduce was taken by Fred. Gutekunst at his galleries in the early part of 1876.

THE ACTION OF THE EYE.[1]

NIKOLA TESLA.

IT CAN be taken as a fact, which the theory of the action of the eye implies, that, for each external impression, that is, for each image produced on the retina, the ends of the visual nerves concerned in the conveyance of the impression to the mind, must be under a peculiar stress or in a vibratory state. It now does not seem improbable that, when by the power of thought an image is evoked, a distant reflex action, no matter how weak, is exerted upon certain ends of the visual nerves, and, therefore, upon the retina. Will it ever be within human power to analyze the condition of the retina when disturbed by thought or reflex action, by the help of some optical or other means of such sensitiveness that a clear idea of its state might be gained at any time? If this were possible, then the problem of reading one's thoughts with precision, like the characters of an open book, might be much easier to solve than many problems belonging to the domain of positive physical science, in the solution of which many, if not the majority, of scientific men implicitly believe. Helmholtz has shown that the fundi of the eyes are themselves luminous, and he was able to *see*, in total darkness, the movement of his arm by the light of his own eyes. This is one of the most remarkable

[1]Extract from paper on the "Action of the Eye," read before Franklin Institute.

experiments recorded in the history of science, and probably only a few men could satisfactorily repeat it, for it is very likely that the luminosity of the eyes is associated with uncommon activity of the brain and great imaginative power. It is fluorescence of brain action, as it were.

Another fact having a bearing on this subject which has probably been noted by many, since it is stated in popular expressions, but which I cannot recollect to have found chronicled as a positive result of observation, is, that at times, when a sudden idea or image presents itself to the intellect, there is a distinct and sometimes painful sensation of luminosity produced in the eye, observable even in broad day-light.

Two facts about the eye must forcibly impress the mind of the physicist, notwithstanding he may think or say that it is an imperfect optical instrument, forgetting that the very conception of that which is perfect or seems so to him, has been gained through this same instrument. Firstly, the eye is, as far as our positive knowledge goes, the only organ which is *directly* affected by that subtile medium, which, as science teaches us, must fill all space; secondly, it is the most sensitive of our organs, incomparably more sensitive to external impressions than any other.

This divine organ of sight, this indispensable instrument for thought and all intellectual enjoyment, which lays open to us the marvels of this universe, through which we have acquired what knowledge we possess, and which prompts us to and controls all our physical and mental activity,—by what is it affected? By light! What is light?

It is beyond the scope of my lecture to dwell upon the subject of light in general, my object being merely to bring presently to your notice a certain class of light effects and a number of phenomena observed in pursuing the study of these effects. But to be consistent in my remarks it is necessary to state that according to the idea now accepted by the majority of scientific men as a positive result of theoretical and experimental investigation, the various forms of manifestation of energy which were generally designated as "electric," or more precisely "electro-magnetic," are energy manifestations of the same nature as those of radiant

heat and light. Therefore the phenomena of light and heat, and others besides these, may be called electrical phenomena. Thus electrical science has become the mother science of all, and its study has become all-important. The day when we shall know exactly what "electricity" is, will chronicle an event probably greater and more important than any other recorded in the history of the human race.

MAKING USE OF EXPOSED OR FOGGED PLATES.

M. MAX FOREST has just issued through the publishing house of Messrs. Gauthier-Villars, of Paris,[1] a useful little book pointing out the numerous photographic uses which may be made of fogged plates, or plates which have been accidentally exposed to the light. Some of these uses we may describe in brief, and for further details and for other processes, we must refer our readers to M. Forest's book.

Using Fogged Plates for Collotype.—Let us, says M. Forest, take a gelatino-bromide plate which has seen the light, and which consequently is of no use for making a negative. We immerse it in the hyposulphite bath till clear, and wash it thoroughly, when we shall have a glass plate having nothing but a film of plain gelatine. The film is now dried off with a cloth, and the plate is immersed for a few minutes in the following bichromate sensitising bath:

Water	100 parts.
Bichromate of potassium	5 parts.

The plate, being now removed from the bath, is set up in a dark room to dry, after which it is exposed under a reversed negative, the exposure being a little less than would be required for a print on albumenized paper, from the same negative. The next step is to soak the plate in water until it no longer tints the fluid yellow from the dissolving out of the bichromate, after which the edges of the still damp plate are varnished with the following:

Alcohol	75 c.c.
Water	5 c.c
White shellac	30 grammes.

[1] "Ce qu'on pent fair avec des Plaque Voilées." Par Max Forest. Crown octavo; 52 pages; price 1 fr. Paris, 1893: Gauthier-Villars et Fils, 55, Quai des Grands-Augustins.

Before the plate is completely dry, it is inked with a fatty ink (lithographic or collotype printing ink), which may be applied with a gelatine roller. As inking slabs, two photographic plates a size larger than that to be printed from are used, and a little ink being spread upon one of them by means of a knife, it is distributed with the roller. When this ink appears as a dull, even film, the second plate is brought into use, what ink adheres to the roller being evenly distributed. The right amount of ink can only be learned by practice, but a very small quantity will suffice. The printed (and still damp) plate is now inked, and if all conditions are right, the ink will form a perfect picture, which can be printed off on enamel paper in the following manner:

The plate bearing the image is laid, back downwards, on a thick piece of felt, and then the enamel paper is laid with its face in contact with the inked surface, after which a sheet of smoothed cardboard is laid on, and gentle pressure is applied by means of a copying-press. The first proof may be bad from irregular or defective inking, but, suitable care being taken with subsequent copies, about twenty-five impressions may be obtained from each plate.

To Restore the Sensitiveness to Exposed Plates.—For this purpose the following bath is recommended:

Water	1,000 c.c.
Bichromate of potash	20 grammes.
Nitric acid	2 to 4 c.c.

The plates are allowed to remain in this solution for twelve hours (the solution should not be used a second time), after which they are very thoroughly washed, and dried in a place protected from actinic light. Plates thus restored are slow and well suited for copying, but, before development, they should be soaked for ten minutes in the following:

Water	1,000 c.c.
Tartaric acid	1 gramme.

Development with an old hydroquinone bath, or a bath well restrained with bromide of potassium, is recommended.

Another preparation for restoring sensitiveness is:

Bromine water (containing 3 per cent. of bromine)	50 c.c.
Tincture of iodine	20 c.c.
Water	1,000 c.c.

Two or three minutes in this bath suffices, and a moderate washing with water is sufficient.

Blue Transparencies from Fogged Plates.—Having freed the plate from silver by the method indicated above, and washed, it is immersed in the following for two or three minutes and dried:

A	Water	500 c.c.
	Ammonia citrate of iron	180 grammes.
	Oxalic acid	8 grammes.
B	Water	500 c.c.
	Potassium ferricyanide	120 grammes.

For use mix:

A	250 c.c.
B	325 c.c.

Exposure is continued till details show, when the plate should be soaked for ten miuutes in water, which should be changed several times, after which the blue tint is brightened by a few minutes' immersion in

Water	125 c.c.
Bichromate of potassium	12 grammes.
Chromic acid	1 gramme.

Careful washing is now required.

M. Forest's book further tells the reader how to convert the spoiled plates into gelatino-chloride plates, and how to make plates for positive transparencies by other methods, also how to use the gelatine film as a basis upon which to paint in albumen-colors, ordinary water-colors, or oil-colors. For this purpose the gelatine-plate, after having been freed from its silver salts, is immersed in an albumen bath prepared as follows:

White of egg	50 grammes.
Water	25 c.c.
Citric or acetic acid	1 gramme.

When dried, the plate will take albumen-colors readily.

For water-colors, the preparation is:

White of egg	40 grammes.
Water	20 c.c.
Boric acid	5 grammes.

The preparation fitting the plate to take oil-color is a sort of emulsion of oil of turpentine prepared by dissolving

Alum	8 grammes.
Hyposulphite of soda	8 grammes.

In

Hot water	15 c.c.

And stirring in

Oil of turpentine	25 grammes.

There is much in M. Forest's book to interest the experimentalist.

—*Photographic Work.*

THE COMBINED TONING AND FIXING BATH.

SO much has been said pro and con concerning the use of the combined toning and fixing bath that the photographic fraternity is much interested in any authentic evidence that it can get on the subject. For this reason the display of the Eastman Company was one of the centers of attraction at the convention. Displayed side by side were two prints from the gallery of W. H. Allen, of Lawrence, Mass., which had been displayed side by side in his show-case for eight months. One was on solio, toned on the combined bath, and the other on albumen, toned and fixed separately. The albumen print was badly discolored, while the solio was as bright and clear as the day when it was toned, showing that with solio at least the combined bath is a success.

Another picture in evidence was an albumen print of the "Cleveland Junto," toned on the combined bath by E. Decker, of Cleveland, Ohio, in the year 1860. Although a third of a century old, this print is remarkably well preserved, and shows less discoloration than the card upon which it is mounted. An autograph letter from Mr. Decker accompanied the print, and was an authority that cannot be doubted.

There were several collections of solio prints toned on the combined bath from the show cases of well-known photographers, all of which had been exposed to strong light from eight to ten months, and had lost none of their original strength and beauty. Perhaps the most interesting part of the exhibit was a display of a hundred or more prints showing the method used by the Eastman Company for testing the permanency of each emulsion. One-half of each of these prints had been covered by a card and the other half exposed to strong light for a period ranging from four months to over a year. In nearly every case these prints were so well preserved that it was impossible to detect which side had been covered, and none of them were sufficiently burned to be noticeable. Every print was marked with the emulsion and the date of toning. All were toned on the com-

bined bath, giving indisputable evidence of the success of the combined bath with solio.

To show the remarkable keeping qualities of solio before toning there were three prints on exhibition which were made on paper that was eleven months old before printing, and which had the fine detail, rich finish and high gloss for which solio is famous.

There was in addition a handsome display of photographs showing the wide range of tones which can be secured, from warm to cold.

The Eastman demonstrators were on hand and gave a practical exhibition of the working of the paper, several batches of prints being toned every day; dried on ferrotype plates and given away as souvenirs of the convention.

Photographing City Survey Work.—Mayor Stuart's administration as Mayor of the City of Philadelphia has been distinguished by the great improvement in the bureau reports, indicating a corresponding advance in the work of the departments. The last report out is that of the Bureau of Surveys. The new volume is embellished with the first fruits of the Photographic Department recently attached to the Survey Bureau. During the year a commodious dark-room for photographic purposes was constructed in the entresol on the third floor of the City Hall, beneath the Survey Office. A partial outfit had been purchased in 1890, but all exposures had to be developed at the home of the operator till the construction of the dark room at headquarters. The photography of the bureau is found to be of great service in recording the progress of work under contract, and also in aiding juries of view to determine damages to private property. Two of the first and best views taken by the bureau photographers represent a section of the new aqueduct where it crosses Cresheim Creek, over the gorge of the Devil's Pool. The span of the arch is 116 feet, the second largest in the United States, and the same as that of the Pont Napoleon, Paris, and is exceeded in this country only by the Cabin John aqueduct at Washington, D. C., which has a span of 220 feet. One view shows the work of building the arch just after the first stones have been put in place. The other shows the entire span, completed, the fifteenth in point of size in the world.

The Editorial Dropshutter.

A writer in our Chicago contemporary, the *Photo-Beacon*, for July sees fit to make himself somewhat merry over our leader in the AMERICAN JOURNAL OF PHOTOGRAPHY for May. Now we have not the least objection to any one criticising any of our papers, in fact we invite it, but we like to see it done in a gentlemanly manner. It would be well for the writer in question, who masquerades behind a nom-de-plume as the "Watchman," while his effusions bear the rather euphonious title "Words from the watch tower," to remember the old saying that "familiarity breeds contempt." There is no association whatever between the Editor of this JOURNAL and the individual in question to warrant the style indulged in by the aforesaid "Watchman." Now then, in regard to the commercial feature of photographic exhibitions we will have some extended remarks in the near future. As to our opinions of the late joint exhibition, as set forth in the AMERICAN JOURNAL OF PHOTOGRAPHY for May, we stand by every word we then wrote, and we are safe in the statement that, had the aforesaid "Watchman" been present at the exhibition, he would have agreed with us in our criticism as set forth in the editorial note on page 231 of the same journal, which no doubt escaped his notice, and which thus far has remained unanswered.

An Expensive Review.—The publishers of *Photography Annual*, to save postage, sent out for review the current volume by freight, and it came to us at a cost of $2.55 freight and charges, and as we had no way of knowing what was in the package, we were forced to submit to the extortion. The price of the book is but half-a-crown (2/6): had the publishers profited by our loss we should not object. In the future, however, we shall decline to receive books sent to us without previous notice, in that manner.

Restraining.—Dr. Eder says: "The best restrainer and the most efficient fog preventive for hydrochinon developed plates is an old developer, which has already been repeatedly used. With it development proceeds slowly, and the intensity is normal. The restraining action is due to the oxidation products of the hydrochinon, not to the presence of bromide."

Aluminum Tripods are now advertised in Germany. The legs are composed of drawn tubes without seams.

Our Illustrations.—Our readers will find with this issue a print on Kirkland's Lithium Paper, of W. F. Cody, Buffalo Bill, made by C. H. Wells, Denver, Colorado. The prints speak for themselves, the paper holding every detail of the negative, and giving a pleasing softness of tone which is charming. The manufacturers of this paper have always laid great stress on the possibility of toning their paper with only a small quantity of gold or without it altogether with the use of the combined fixing and toning bath. Of course there are many objectors to the use of the combined bath, but the makers of this paper assert and stand ready to prove that if their paper is toned with the following bath the prints will be as permanent as could be desired. The bath is made as follows:

FOR PURPLE TONES.

Water	160 ounces.
Hypo	32 "
Acetate Soda	1 "
Nitrate Lead	½ "
Powdered Alum	8 "
Chloride Gold	7 grains.

Dissolve the lead in a small quantity of water. Then put lead and balance of chemicals (including gold) into a stone jar and dissolve with water.

For tones bordering on black, increase gold.

For warm or cherry tones, omit gold in formula. If greenish tinge occurs in half-tones, add gold, by putting the gold into the tray and pouring the bath into it.

One advantage of this bath is that if the prints when dry have a too warm tone they may be returned to the bath and toned further.

This paper gives prints that withstand hot water, which is quite an item in hot weather.

Kirkland Lithium Paper may be obtained direct of the manufacturers, Cheyenne, Wyo., or any reliable Photo Stock dealer, and in all sizes up to full sheets, 20x24 inches, or in rolls 25 inches wide. The company are taking every means to produce a paper of uniform quality which will recommend itself to all photographers who once use the paper. A sample will be sent to any one on application.

In commenting upon the paper on lantern work lately read before the Photographic Society of Philadelphia, our English contemporary *Photography* is rather unnecessarily severe when it states that "the writer of the paper cannot know much of the subject."

Photographic Hints and Formulæ.

REDUCIN.

A NEW developer under above name has been introduced by the Chemische Fabrik auf Actien, late E. Schering, of Berlin, and which, like amidol, acts as an energetic reducing agent on gelatino-bromide films without the addition of an alkali, is said to be the hydrochloride of diamido-resorcin. According to Prof. H. W. Vogel, the substance has been much improved of late, forming now a nearly white mass of loose crystal needles. Prof. Vogel has repeated his experiments with the improved substance, and the following formula was used:

Reducin	3 grammes.
Sodium sulphite	25 grammes.
Sulphuric acid	9 drops.
Water	500 c.c.

In dissolving the reducin in the water, the latter acquired a strange greenish color; and in adding the sulphuric acid and the sodium sulphite it turned yellow. It is said, however, that the solution becomes clear again if kept in well-stoppered bottles. Two plates, equally exposed to the same subject, were developed at the same time, one with pyro-soda, the other with reducin and whilst with the latter the image appeared at once, it was about thirty seconds, in the case of pyro-soda, before the image became apparent. The experiment was repeated; but this time one plate was exposed twice as long as the other, and the less-exposed plate was developed with reducin, the other with pyro. Also in this case the image in the reducin appeared considerably earlier than that in the pyro, the relation being about 1 to 6 in favor of the reducin developer. The quality and detail were the same in both cases. From these and other experiments Prof. Vogel concludes that the reducin is a first-class rapid developer —*i.e.*, it develops the same image with half the exposure of that required by the pyro developer. Besides it is said that the negatives developed with it are softer and more harmonious than

those developed with pyro. Considerable quantities of bromide of potassium may be added to the reducin developer without interfering with its developing power, but the contrasts of the negative are improved. The reducin developer may, therefore, be specially recommended for instantaneous exposures if it is desired to produce soft images, as, for instance, for portraits taken in the studio; if, however, a large amount of density is required in the negatives, the pyro developer is still to be preferred.

Warm-Toned Platinum Tints.—Cold developed platinum prints immersed in a bath of uranium nitrate assume a brownish-violet tint, but do not go beyond that color, and never change to red, even by a prolonged action of the bath. Provided always that the development of the print has been by the cold bath process, a reddish (röthel) color is obtainable by the following process:

Add to 1 liter (34½ ounces) of the developer from 100 to 200 c.cm (3½ to 7 ounces) of a 4 per cent. solution of mercuric chloride. Less mercury produces browns of lesser intensity, while with more this intensity of color increases.

If after developing, fixing and washing, the print is immersed in the uranium bath:

Water	1 liter (34½ ounces)
Uranium nitrate	10 grammes (2½ drachms)
Ferricyanate of potassium . .	2 grammes (1½ drachms)
Glacial acetic acid	60 grammes (2 ounces)

the tone changes gradually to a fine sepia color, becomes reddish by a continued action, and finally turns to a positive red. When the desired tone is attained, wash for ten minutes in pure water, acidified with glacial acetic acid, and finally rinse off. Prolonged washing will either injure or reduce the tone. Washing the prints in a dilute solution of ferric chloride turns them green. In order to eliminate from the print all excess of iron, wash in water acidulated with hydrochloric or acetic acid. Continual washing of a green print in water tends to reduce its color intensity, which can, however, be restored by again treating it with a solution of ferric chloride.—*Photographische Correspondenzen.*

Uranium Toning of Platinotypes.—Print a trifle further than under ordinary circumstances. Add to each ounce of the oxalate developer a few drops of a saturated solution of bichloride of mercury;

the quantity of the latter regulates the depth of reddishness in the toning operation. After developing, eliminate very carefully every trace of iron in the print, this being *absolutely* necessary in order to get satisfactory results. In order to be safe give the print an extra bath of

Hydrochloric acid (concentrated chem. pure) . . 1 part
Water . . . . . 25 parts

and then wash thoroughly. Now mix the toning solution, which consists of

Uranium nitrate . . . . . 4 parts
Ferricyanide potassium . . . . . 1 part
Water . . . . . 400 parts
Glacial acetic acid . . . . . 30 parts

which is ready for use in about five minutes. Dip the print into this, and in a short while it will have assumed a brown tone, while the whites will have remained perfectly pure. The continuation of toning will gradually change the color to a brownish red, and in time to a red, this latter depending, as before mentioned, upon the amount of bichloride of mercury originally used with the oxalate developer. When through with toning, wash the print for a few minutes in running water, after which it is ready for mounting.

Very beautiful tones can be obtained on platinum paper in following the above instructions, and in altering the proportions of the various salts used. As with other things, a small addition of brains is of the greatest value in obtaining the best results.

A Combined Developer.—The following formula is stated to produce fine results with the Seed plates:

Solution No. 1.

Hydrochinone . . . . . 1 oz.
Eikonogen . . . . . 1 oz.
Merck's Sulphite Soda, C. P. . . . . 3 oz.
Water . . . . . 90 oz.

Dissolve the eikonogen in boiling hot water, and shake ten minutes after it is dissolved, then add the hydrochinone and soda.

Solution No. 2.

Carbonate Potass. . . . . 5 oz.
Water . . . . . 60 oz.

For use take 3 ozs. of No. 1 to 2 oz. No. 2.

This stock solution keeps indefinitely. Old developer may be saved. For full-timed exposures use old and new developer mixed in about equal parts. Should plates be over-timed use all old, and if under-timed all fresh, developer.

Photographic Scissors and Paste.

A Seaside Incident.—Amateur photography, writes a correspondent, is more popular than ever at the seashore, that is, with the hand-cameraist. I haven't noticed that the victim is any more resigned to his fate than he ever was, but as he is seldom consulted in the operation, that makes little difference. It is only now and then that the presser of the button asks permission to take snapshots at good subjects, and even when it is given the process is not always productive of satisfactory results. For instance, a good many of you know John R. McFetridge, Jr., the best amateur base ball pitcher in Pennsylvania, a young man who spent several months each year in Pittsburgh. Physically, he is a model of muscular development, and in a bathing suit is a fine subject for a kodak fiend. While lounging in the sand the other day Mr. McFetridge was approached by a pretty young woman, who blushed and said:

"I beg your pardon, but would you object to being taken?"

"Why—certainly—certainly not," stammered the athlete. "I never had it before—what is it, anyhow?"

"Oh, it won't hurt you," chirped the maiden. "Please say yes."

Without having the most remote idea what he was consenting to Mr. McFetridge succumbed, and a few minutes latter was being posed against a piling under the boardwalk. Behind him was a group of children playing in the sand.

"Now, then, raise your chin, please," said the damsel. "Throw out your chest and look as if you were leading an army to victory."

The button snapped, and a smoker in the pavilian above tossed over the rail a lighted vesuvian match, which landed right on the head of a young man who was gritting his teeth in a mighty effort to clinch a Napoleonic expression. The hair took fire, and the spectators in the immediate vicinity were treated to the unusual sight of a man in a bathing suit trying to bore a hole in the sand with his head. You ought to see that picture.

Temperance Photography.—Travelers in San Francisco, who have missed the last car and are trying to find their way home, need not be surprised to have a bright light flashed upon them at any moment. A temperance society of one of the prominent churches in that city has inaugurated a movement to have its agents out during the dark hours, provided with a camera and flash lamp. It is the

intention to make photographs of the men who have over-estimated their capacity in the liquor line, with the hope that on showing a subject a picture of himself, as he was when drunk, he will become so disgusted that he will at once join the temperance ranks.

The telautograph is the latest telegraphic invention. It transmits any distance a fac-simile of handwriting, or almost anything that can be executed with a pencil on paper. This is a remarkable advance upon all the many wonderful telegraphic inventions and devices. Having accomplished that much, what will be the next step in advance?

A Photographic Counterfeit Note.—The Secret Service Division Bureau of the Treasury Department is in receipt of a new counterfeit five-dollar note made by a photographic process. The counterfeit is on the Lagonda National Bank, of Springfield, Ohio, and is a very poor one, no attempt being made to imitate the localized fibre paper or the silk threads of the genuine paper.

Stellar Spectrum Analysis.—At Lick Observatory some important discoveries have lately been made with the spectroscope. Prof. Campbell has trained the big equatorial with its spectroscope attached on the comet, and has established the fact that the comet is composed of incandescent carbon and nitrogen, being itself luminous. Some interesting work has been done on bright line stars, the big telescope flashing through the spectroscope many new lines that indicate unsuspected elements in these stars. The new star, Nova Auriga, has been proved a nebulous body, as the spectrum shows the same features as the spectrum of nebulous stars. The best discoveries at the Lick Observatory have been made by aid of the spectroscope applied to the great equatorial. D. O. Mills, the New York capitalist, who is an old Californian, and who has taken much interest in the observatory, has just given money to purchase a new spectroscope of the latest design. With this astronomers on Mount Hamilton ought to make important discoveries this winter.

The human body contains 150 bones and 500 muscles; the heart beats 70 times a minute, displacing each time 44 grammes of blood. All the blood passes through the heart in three minutes. In a normal condition the lungs contain 5 litres of air; we breathe 1200 times every hour. There are 13 elements in the body, 5 gaseous and 8 solid. A man weighing 76 kilogrammes represents 44 kilogrammes of oxygen, 7 of hydrogen, 1.73 of azote, 600 grammes of chlorine, 100 grammes of fluorine, 22 kilogrammes of carbon, 800 grammes of phosphorus, 100 grammes of sulphur, 1750 grammes of calcium, 80 grammes of potassium, 50 grammes of iron; no precious metals.

In the Twilight Hour.

THE good never lose by being persecuted.

IF you want to get happiness, try to give it.

THE wren has a sweeter song than the peacock.

ALL churches have some members who talk too much.

THE man who has the king's word commands the royal army.

EVERY man is a hypocrite who prays one way and lives another.

VIRTUE is always paying dividends.

SUCCESS in this world may mean failure in the next.

SIN can banish men from God's presence, but it can never separate them from his love.

WHENEVER a doubt is admitted into a Christian's heart the bank of heaven immediately closes.

IN the matter of giving to the poor what is most needed is not *benevolence* but *beneficence*. One *means* well, the other *does* not.

Literary and Business Notes.

REPORT of the annual meeting of the Photographic Society of Japan for 1892 has been received. It contains the proceedings, with rules and list of members, in both Japanese and English. It is printed by K. Kubunsha, Tokyo, Japan.

STANDARD SCREWS.—Taylor, Taylor & Hobson, of London, England, send a little book describing the recent improvements in standard screws for attaching photographic lenses to cameras. For a number of years the firm have taken a prominent part in securing the use everywhere of one system of fittings for this purpose, and it is not necessary to point out the great advantage which photographers would gain by having their lenses everywhere interchangeable. The sizes of screws which have been adopted are the standards of the Photographic Society of Great Britain. These are already used by many lense-makers in this country and in various other parts of the world, and they were recommended by the International Congress recently held in Brussels and Paris. The improvements, however, which Messrs. Taylor & Hobson have made upon the Society's standards make them even more useful and desirable, and we look forward to the time when they willl be used everywhere.

CE QU'ON FAIRE DES PLAQUES VOILEES. PAR MAX FOREST.—Gauthier, Villars et Fils. Quai des Grands Augustins 55, Paris, France.

This comprehensive work explains the various uses to which spoiled or light-struck dry-plates can be put. We reprint several translations from the work elsewhere in the present Journal.

LES DEVELOPATEURS ORGANIQUES EN PHOTOGRAPHIE, PAR MM. Auguste et Louis Lumiere. Gauthier, Villars et Fils. Quai des Grands Augustins 55, Paris, France.

The experiments and publications of the Messr. Lumiere have been of great value to the photographic world at large, their influence extending far without the bounds

of their own country. A new and exhaustive work like the present one should be translated into both English and German languages. We shall print some extended extracts from the work in a future number.

CATALOGUE OF THE LIBRARY AND MUSEUM OF THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—London, 1893, Harrison & Son, St. Martin's Lane.

The National British Society is the first photographic society to print and publish a catalogue of their library, in which are enumerated the various books, serials, pamphlets and publications in the Society's possession up to July 1st, 1893. We infer that in addition to increasing the library, the Council is making an effort to gather a collection of specimens which will have a historic value.

RECETTES ET CONSEILS A L'AMATEUR PHOTOGRAPHIE, PAR GEORGES JARDIN.—Quai des Grands Augustins 55, Paris.

A small work of 70 pages, giving useful hints as to selection and care of apparatus and the rudiments of the art. A good book for the French beginner.

PHOTOGRAPHY ANNUAL.—Large octavo, 796 pages. Edited by Edward Strumey. London, Iliffe & Son, 3 St. Bride Street, Ludgate Circus.

The third issue of an annual by the publishers of *Photography*. The book is filled with valuable matter for instruction and reference. The Editor is to be congratulated on the success of the present volume, which, if possible, surpasses his previous efforts.

DIE BLITZ-LICHT PHOTOGRAPHIE. Anleiting zum Photographiren bei magnesiumlicht, Von Herman Schnauss, Düsseldorf. Ed. Liesegang's Verlag, 1893.

This work, like all emanating from Dr. Herman Schnauss, is noted for the exhaustive manner in which the subject is handled. As the title indicates, the work is a textbook on photography by artificial light —Blitz-Pulver and Magnesium. Every branch of the art is covered. The book is fully illustrated with eight plates and forty-five cuts in the text. But few photographers are aware of the wide scope which is opened by the use of Blitz-Pulver, and the results to be achieved by the intelligent use of that illuminant.

The book is recommended to every German-reading photographer..

RECENT PATENTS.

THE following list of patents, relating to the photographic interests, issued by the United States Patent Office, during the month of June, is specially reported by Franklin H. Hough, Solicitor of American and Foreign Patents, 925 F street, N. W., Washington, D. C.:

498,963.—Camera-shutter. Wm. F. Torrey, Providence, R. I.

499,975.—Photograph-holder. Dion T. Elmer, Monroe, Mich.

500,023.—Photographic-camera. Bertel G. P. Moller, Kolding, Denmark.

499,763.—Photographic-plate holder. Robert B. Taffer, Des Moines, Iowa.

500,348.—Photographic camera. John F. Parsons, Bristol, England.

500,180.—Photographic printing apparatus. Richard W. Wynkoop and J. M. Kemp, Paterson, N. J.